(viii) Notifications, related to the event, that were made or are planned to any local, State, or other Federal agencies;

(ix) Status of any press releases, related to the event, that were made or are planned.

(2) Written report. Each licensee that makes a report required by paragraph (a) or (b) of this section, or by §70.74 and Appendix A of this part, if applicable, shall submit a written follow-up report within 30 days of the initial report. Written reports prepared pursuant to other regulations may be submitted to fulfill this requirement if the report contains all the necessary information, and the appropriate distribution is made. These written reports must be sent to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, DC 20555, with a copy to the appropriate NRC regional office listed in Appendix D of 10 CFR Part 20. The reports must include the following:

(i) Complete applicable information required by §70.50(c)(1);

(ii) The probable cause of the event, including all factors that contributed to the event and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned;

(iii) Corrective actions taken or planned to prevent occurrence of similar or identical events in the future and the results of any evaluations or assessments; and

(iv) For licensees subject to Subpart H of this part, whether the event was identified and evaluated in the Integrated Safety Analysis.

(d) The provisions of §70.50 do not apply to licensees subject to §50.72. They do apply to those Part 50 licensees possessing material licensed under Part 70 that are not subject to the notification requirements in §50.72.

[56 FR 40769, Aug. 16, 1991; 56 FR 64980, Dec. 13, 1991, as amended at 59 FR 14087, Mar. 25, 1994; 65 FR 56226, Sept. 18, 2000]

§70.51 Material balance, inventory, and records requirements.

(a) As used in this section:

(1) *Additions to material in process* means receipts that are opened except for receipts opened only for sampling and subsequently maintained under tamper-safing, and opened sealed sources.

(2) *Enrichment category* for uranium-235 means high-enriched uranium—that uranium whose isotope content is 20 percent or more uranium-235 by weight, and low-enriched uranium—that uranium whose isotope content is less than 20 percent uranium-235 by weight.

(3) *Element* means uranium or plutonium.

(4) *Fissile isotope* means (i) uranium-233 or (ii) uranium-235 by enrichment category.

(5) *Limit of error* means the uncertainty component used in constructing a 95 percent confidence interval associated with a quantity after any recognized bias has been eliminated or its effect accounted for.

(6) *Material balance* means a determination of material unaccounted for (MUF) by subtracting ending inventory (EI) plus removals (R) from beginning inventory (BI) plus additions to inventory (A). Mathematically,

$$MUF=BI+A-EI-R$$

(7) *Material in process* means any special nuclear material possessed by the licensee except in unopened receipts, sealed sources, and ultimate product maintained under tamper-safing.

(8) *Physical inventory* means determination on a measured basis of the quantity of special nuclear material on hand at a given time. The methods of physical inventory and associated measurements will vary depending on the material to be inventoried and the process involved.[1]

(9) *Removals from material in process* includes measured quantities of special nuclear material disposed of as discards, encapsulated as a sealed source, or in other ultimate product placed under tamper-safing or shipped offsite.

(10) *Tamper-safing* means the use of devices on containers or vaults in a manner and at a time that ensures a clear indication of any violation of the integrity of previously made measurements of special nuclear material within the container or vault.

[1] Criteria for physical inventories are set out in paragraph (f) of this section.

(11) *Ultimate product* means any special nuclear material in the form of a product that would not be further processed at that licensed location.

(12) *Unopened receipts* means receipts not opened by the licensee, including receipts of sealed sources, and receipts opened only for sampling and subsequently maintained under tamper-safing.

(b) Licensees subject to the recordkeeping requirements of §§ 74.31, 74.33 and 74.59 of this chapter are exempt from the requirements of § 70.51(b) (1) through (5). Otherwise:

(1) Each licensee shall keep records showing the receipt, inventory (including location), disposal, acquisition, and transfer of all special nuclear material in his possession regardless of its origin or method of acquisition.

(2) Each record that is required by the regulations in this part or by license condition must be maintained and retained for the period specified by the appropriate regulation or license condition. If a retention period is not otherwise specified by regulation or license condition, the licensee shall retain the record until the Commission terminates each license that authorizes the activity that is subject to the recordkeeping requirement.

(3) Each record of receipt, acquisition, or physical inventory of special nuclear material that must be maintained pursuant to paragraph (b)(1) of this section must be retained as long as the licensee retains possession of the material and for three years following transfer of such material.

(4) [Reserved]

(5) Each record of transfer of special nuclear material to other persons must be retained by the licensee who transferred the material until the Commission terminates the license authorizing the licensee's possession of the material. Each record required by paragraph (e)(1)(v) of this section must be retained for three years after it is made.

(6) Prior to license termination, licensees shall forward the following records to the appropriate NRC Regional Office:

(i) Records of disposal of licensed material made under § 20.2002 (including burials authorized before January 28, 1981[2]), 20.2003, 20.2004, 20.2005;

(ii) Records required by § 20.2103(b)(4); and

(iii) Records required by § 70.25(g).

(7) If licensed activities are transferred or assigned in accordance with § 70.32(a)(3), the licensee shall transfer the following records to the new licensee and the new licensee will be responsible for maintaining these records until the license is terminated:

(i) Records of disposal of licensed material made under § 20.2002 (including burials authorized before January 28, 1981[2]), 20.2003, 20.2004, 20.2005;

(ii) Records required by § 20.2103(b)(4); and

(iii) Records required by § 70.25(g).

(c) Each licensee who is authorized to possess at any one time special nuclear material in a quantity exceeding one effective kilogram of special nuclear material shall establish, maintain, and follow written material control and accounting procedures that are sufficient to enable the licensee to account for the special nuclear material in the licensee's possession under license. The licensee shall retain these procedures until the Commission terminates the license that authorizes possession of the material and retain any superseded portion of the procedures for three years after the portion is superseded.

(d) Except as required by paragraph (e) of this section, each licensee who is authorized to possess at any one time and location special nuclear material in a quantity totaling more than 350 grams of contained uranium-235, uranium-233, or plutonium, or any combination thereof, shall conduct a physical inventory of all special nuclear material in his possession under license at intervals not to exceed twelve months.

(e) Each licensee who is authorized to possess at any one time special nuclear material in a quantity exceeding one effective kilogram of strategic special

[2] A previous § 20.304 permitted burial of small quantities of licensed materials in soil before January 28, 1981, without specific Commission authorization. See § 20.304 contained in the 10 CFR, parts 0 to 199, edition revised as of January 1, 1981.

nuclear material in irradiated fuel reprocessing operations or special nuclear material of moderate strategic significance and to use such special nuclear material for activities other than as sealed sources or those activities involved in the operation of a nuclear reactor licensed pursuant to part 50 of this chapter or those involved in a waste disposal operation; or as reactor irradiated fuels involved in research, development, and evaluation programs in facilities other than irradiated fuel reprocessing plants, shall:

(1) Maintain procedures that include items listed in paragraphs (e)(1) (i), (ii), (iii), (iv), (v), (vi), and (vii) of this section and retain each record required in these paragraphs for three years after the record is made.

(i) Procedures for tamper-safing containers or vaults containing special nuclear material not in process, which include control of access to the devices and records of the date and time of application of each device to a container or vault; unique identification of each such item; inventory records showing the identity, location, and quantity of special nuclear material for all such items; and records of the source and disposition of all such items;

(ii) Records of the quantities of special nuclear material added to or removed from the process;

(iii) Inventory records for the quantity of special nuclear material in process;

(iv) Unique identification of items or containers containing special nuclear material in process; inventory records showing the identity, location, and quantity of special nuclear material for all such items; and records of the source and disposition of all such items;

(v) Documentation of all transfers of special nuclear material between material balance areas to show identity and quantity of special nuclear material transferred;

(vi) Requirements for authorized signatures on each document for transfer of special nuclear material between material balance areas; and

(vii) Means for control of and accounting for internal transfer documents.

(2) On or before May 6, 1974, and thereafter as necessary to comply with the requirements of paragraph (e)(3) of this section, perform a physical inventory of all special nuclear material in his possession in compliance with the criteria for physical inventories set forth in paragraph (f) of this section.

(3) Conduct physical inventories made in accordance with the criteria for physical inventories set forth in paragraph (f) of this section at intervals determined from the start of the beginning inventory to the start of the ending inventory not to exceed:

(i) 2 calendar months for plutonium except for plutonium containing 80 percent or more by weight of the isotope Pu-238, uranium-233 and for uranium enriched 20 percent or more in the isotope uranium-235 (except as provided in paragraph (e)(3)(ii) of this section); and

(ii) 6 calendar months for uranium enriched less than 20 percent in the isotope uranium-235; for plutonium, U–233 and high-enriched uranium in that portion of an irradiated-fuel reprocessing plant from the dissolver to the first vessel outside of the radiation shielded portion of the process; and for plutonium containing 80 percent or more by weight of the isotope Pu-238;

(4) Within 30 calendar days after the start of each ending physical inventory required by paragraph (e)(3) of this section:

(i) Calculate, for the material balance interval terminated by that inventory, the material unaccounted for (MUF) and its associated limit of error for each element and the fissile isotope for uranium contained in material in process;

(ii) Reconcile and adjust the book record of quantity of element and fissile isotope, as appropriate, to the results of the physical inventory;

(iii) Complete and maintain for a period of five years material balance records for each material balance showing the quantity of element and fissile isotope, as appropriate, in each component of the material balance, with the associated limit of error for the material unaccounted for both in terms of absolute quantity of element and fissile isotope and relative to additions to or removals from material in process for the interval, where results

of limit of error calculations are recorded in sufficient detail to permit an evaluation of sources of error.

(iv) Complete and maintain for a period of five years a record summarizing the quantities of element and fissile isotope, as appropriate, for ending inventory of material in process, additions to material in process during the material balance interval and removals from the material in process during the material balance interval; and

(v) Complete and maintain for a period of five years a record summarizing the quantities of element and fissile isotope, as appropriate, in unopened receipts (including receipts opened only for sampling and subsequently maintained under tamper-safing), and ultimate products maintained under tamper-safing, or in the form of sealed sources;

(5) Establish and maintain a system of control and accountability such that the limits of error for any material unaccounted for (MUF) ascertained as a result of the material balances made pursuant to paragraph (e)(3) of this section do not exceed (i) 200 grams of plutonium or uranium-233, 300 grams of high enriched uranium or uranium-235 contained in high enriched uranium, or 9,000 grams of uranium-235 contained in low enriched uranium, (ii) those limits specified in the following table, or (iii) other limits authorized by the Commission pursuant to paragraph (e)(6) of this section:

Material Type	Limit of Error of MUF on Any Total Plant Inprocess Material Balance [3] Percent
Plutonium element or uranium-233 in a chemical reprocessing plant	1.0
Uranium element and fissile isotope in a reprocessing plant	0.7
Plutonium element, uranium-233, or high enriched uranium element and fissile isotope—all other	0.5
Low-enriched uranium element and fissile isotope—all other	0.5

[3] As a percentage of additions to or removals from material in process, whichever is greater.

Any licensee subject to this paragraph on December 6, 1973, who requests higher limits pursuant to paragraph (e)(6) of this section at the time he submits his program description under the provisions of paragraph (g) of this section is hereby authorized to operate at the higher limits until the application for license or amendment has been finally determined by the Commission;

(6) An applicant or a licensee subject to the requirements of paragraph (e) of this section may request limits higher than those specified in paragraph (e)(5) of this section. The requested higher limits shall be based on considerations such as the type and complexity of process, the number of unit operations, process throughput quantities, process recycle quantities, and the technology available and applicable to the control and accounting of the material in the process. The Commission will approve higher limits if the applicant demonstrates:

(i) That he has made reasonable efforts and cannot meet the limits of error of MUF specified in paragraph (e)(5) of this section; and

(ii) That he has initiated or will initiate a program to achieve improvements in his material control system so as to meet the limits specified in paragraph (e)(5) of this section.

(f) Each licensee subject to the requirements of paragraph (e) of this section shall:

(1) Establish physical inventory procedures to assure that:

(i) The quantity of special nuclear material associated with each item on inventory is a measured value;

(ii) Each item on inventory is listed and identified to assure that all items are listed and that no item is listed more than once;

(iii) Cutoff procedures for transfers and processing are established so that all quantities are inventoried and none are inventoried more than once;

(iv) Cutoff procedures for records and reports are established so that all transfers for the inventory and material balance interval and no others are included in the records; and

(v) Upon completion of the inventory, all book and inventory records, both total plant and material balance area, are reconciled with and adjusted to the physical inventory.

(2) Establish inventory procedures for sealed sources and containers or vaults

containing special nuclear material that provide for:

(i) Identification and location of all such items;

(ii) Verification of the integrity of the tamper-safing devices for such items;

(iii) Reverification of identity and quantity of contained special nuclear material for each item not tamper-safed, or whose tamper-safing is found to have been compromised;

(iv) Verification of the correctness of the inventory records of identity and location for all such items; and

(v) Documentation in compliance with the requirements of paragraphs (f)(2) (i), (ii), (iii), and (iv) of this section. Each record documenting compliance with these requirements must be retained for three years after it is made.

(3) Establish inventory procedures for special nuclear material in process that provide for:

(i) Measurement of all quantities not previously measured by the licensee for element and fissile isotope; and

(ii) For all material whose content of element and fissile isotope has been previously measured by the licensee but for which the validity of such previously made measurements has not been assured by tamper-safing, verification of the quantity of contained element and fissile isotope by remeasurement.

(4) Conduct physical inventories according to written inventory instructions for each inventory which shall;

(i) Assign inventory duties and responsibilities;

(ii) Specify the extent to which each material balance area and process is to be shut down, cleaned out, and/or remain static;[4]

(iii) Identify the basis for accepting previously made measurements and their limits of error;

(iv) Designate measurements to be made for inventory purposes and the procedures for making such measurements; and

(v) Identify the means by which material on inventory will be listed to assure that each item is inventoried and that there is no duplication.

(g) Each licensee subject to the requirements of paragraph (e) of this section shall submit to the Atomic Energy Commission for approval by March 6, 1974, a full description of the program intended to be used to enable the licensee to comply with that paragraph and the requirements set forth in paragraph (f) of this section. This program shall be followed by the licensee after May 6, 1974.

(h) Each licensee who determines that the requirements of paragraph (e) of this section will require modifications of his plant or equipment costing $500,000 or more may, by March 6, 1974, apply to the Atomic Energy Commission for an extension of time, not to exceed six additional months, for compliance with those requirements. Each application for extension shall include a description of the modifications to be made, a statement of estimated associated costs with substantiating evidence, and a schedule of the dates when the modifications will be commenced and completed.

(i)(1) Records which must be maintained pursuant to this part may be the original or a reproduced copy or microform if such reproduced copy or microform is duly authenticated by authorized personnel and the microform is capable of producing a clear and legible copy after storage for the period specified by Commission regulations. The record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records such as letters, drawings, specifications, must include all pertinent information such as stamps, initials, and signatures. The licensee shall maintain adequate safeguards against tampering with and loss of records.

(2) If there is a conflict between the Commission's regulations in this part, license condition, or other written Commission approval or authorization pertaining to the retention period for the same type of record, the retention period specified in the regulations in this part for such records shall apply

[4] No process shutdown and/or cleanout for inventory is required if requirements with respect to MUF and the limit of error of MUF as specified in paragraph (e)(5)(ii) of this section are met using other inventory methods.

unless the Commission, pursuant to §70.14, has granted a specific exemption from the record retention requirements specified in the regulations in this part.

[38 FR 30544, Nov. 6, 1973, as amended at 38 FR 32784, Nov. 28, 1973; 41 FR 18303, May 3, 1976; 43 FR 6925, Feb. 17, 1978; 50 FR 7579, Feb. 25, 1985; 52 FR 10038, Mar. 30, 1987; 53 FR 19253, May 27, 1988; 56 FR 55998, Oct. 31, 1991; 61 FR 24675, May 16, 1996]

§70.52 Reports of accidental criticality or loss or theft or attempted theft of special nuclear material.

(a) Each licensee shall notify the NRC Operations Center[1] within one hour after discovery of any case of accidental criticality or any loss, other than normal operating loss, of special nuclear material.

(b) Each licensee who possesses one gram or more of contained uranium-235, uranium-233, or plutonium shall notify the NRC Operations Center within one hour after discovery of any loss or theft or unlawful diversion of special nuclear material which the licensee is licensed to possess or any incident in which an attempt has been made or is believed to have been made to commit a theft or unlawful diversion of such material.

(c) This notification must be made to the NRC Operations Center via the Emergency Notification System if the licensee is party to that system. If the Emergency Notification System is inoperative or unavailable, the licensee shall make the required notification via commercial telephonic service or other dedicated telephonic system or any other method that will ensure that a report is received by the NRC Operations Center within one hour. The exemption of §73.21(g)(3) applies to all telephonic reports required by this section.

(d) Reports required under §73.71 need not be duplicated under the requirements of this section.

[52 FR 21657, June 9, 1987, as amended at 59 FR 14087, Mar. 25, 1994]

[1] Commercial telephone number of the NRC Operations Center is (301) 816–5100.

§70.53 Material status reports.

(a)(1) Each licensee who is authorized to possess at any one time and location special nuclear material in a quantity totaling more than 350 grams of contained uranium–235, uranium–233, or plutonium, or any combination thereof, shall complete and submit material balance reports as required by §74.13(a)(1) of this chapter.

(2) Any licensee who is required to submit routine material status reports pursuant to §75.35 of this chapter shall follow the requirements set out in §74.13(a)(2) of this chapter.

(b) Each licensee subject to the requirements of §70.51(e) shall follow the requirements set out in §§74.13(b) and 74.17(b) of this chapter.

[50 FR 7579, Feb. 25, 1985, as amended at 52 FR 19305, May 22, 1987]

§70.54 Nuclear material transfer reports.

(a) Each licensee who transfers and each licensee who receives special nuclear material shall follow the requirements set out in §74.15(a) and (b) of this chapter.

(b) Any licensee who is required to submit inventory change reports on DOE/NRC Form–741 pursuant to §75.34 of this chapter shall follow the requirements set out in §74.15(c) of this chapter.

[50 FR 7579, Mar. 28, 1985]

§70.55 Inspections.

(a) Each licensee shall afford to the Commission at all reasonable times opportunity to inspect special nuclear material and the premises and facilities wherein special nuclear material is used, produced, or stored.

(b) Each licensee shall make available to the Commission for inspection, upon reasonable notice, records kept by the licensee pertaining to his receipt, possession, use, acquisition, import, export, or transfer of special nuclear material.

(c)(1) In the case of fuel cycle facilities where nuclear reactor fuel is fabricated or processed each licensee shall upon request by the Director, Office of Nuclear Material Safety and Safeguards or the appropriate NRC Regional Administrator, provide rent-free